Translation of the pertinent portions of an International Preliminary Examination Report, prepared 03/22/2005 ART 34 AMDT

2. This report contains a total of 4 pages, including this cover page. Attachments are also included in the report.

3. This report contains information regarding the following items:

I X Basis of the Report
V X Reasoned Determination in Accordance with Rule 62.2 a)ii)

I. Basis of the Report

1. The components of the international application:

Specification, pages

3 to 13	in the originally filed version
1,2,2a	received 11/23/04 with letter of 11/19/04

Claims, No.

1 to 25	received 11/23/04 with letter of 11/19/04

Drawings, sheets

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V Reasoned Determination in Accordance with Rule 62(2)

1. Determination

Novelty	Yes: Claims 1 to 25 No: Claims
Inventive Activities	Yes: Claims 1 to 25 No: Claims
Commercial Applicability	Yes: Claims 1 to 25 No: Claims

2. Documents and Explanations:

see the attached sheet

Attached Sheet

Re.: Item V

A displaceable guide element in accordance with the preamble of independent claims 1 and 2 ensues for example from publication DE-A-101 15 916.

The subject of claims 1 and 2 differs from the known guide element by the common characteristic that the diameter of the openings is less than 500 μm and that in every angular position of the guide element fluid emerges over the entire circumference of the guide element from the micro-openings, or that fluid also emerges from the areas around which the web is not looped.

Therefore the subject of claims 1 and 2 is novel (Article 33(2) PCT).

The object to be attained by means of the present invention can be seen to lie in creating, without a large structural outlay, a guide element which can be inclined toward the web and has a homogeneous air cushion, simultaneously along with small losses.

The attainment of this is the recognition, converted to actual use, that micro-openings of less than 500 μm generate a homogeneous air cushion along with a reduced volume flow, so that it is possible to omit elaborate structures for avoiding losses of fluid in the area not looped by the web.

The known publications, either considered by themselves or in combination with each other, were not able to suggest the subject with the characteristics of claims 1 and 2 for the mentioned purpose.

Therefore claims 1 and 2 are based on inventive activities and, together with the advantageous further developments of dependent claims 3 to 25, meet the requirements of Article 33(1) to (4) PCT.

Specification

Guiding Elements for a Strip-Producing or Strip-Processing Machine

The invention relates to guide elements, in particular turning bars, of a web-producing or web-processing machine in accordance with the preamble of claim 1 or 2.

A web guide element designed as a turning bar is known from DE 93 20 281 U1, which can be brought into at least two angled position in relation to an incoming web. In the course of pivoting from a first into the other position, openings of an inner body are displaced in respect to openings in an outer body of the turning bar in such a way that the air outlet openings which are not needed are closed.

A turning bar is disclosed in one exemplary embodiment of USP 3,744,693, in which a tube wall segment made of a porous, air-permeable material, together with a base body, constitutes a closed pressure chamber. The porous segment constitutes a wall of the chamber and is embodied to be load-bearing over the width thereof - without a load-bearing support -. In a second example, a segment with penetration bores is arranged in place of the porous segment.

USP 5,423,468 shows a guide element which has an inner body with bores and an outer body of a porous, air-permeable material. The bores in the inner body are only provided in the area which is expected to be looped.

JP 06 198836 discloses a turning bar, which is embodied

over its entire walls from a porous sinter metal with opening of 10 to 30 μm. through which a fluid can flow.

Devices for guiding of a web are disclosed in WO 00/39011, whose wall between a supply chamber for pressure fluid and the guide face is made solid and self-supporting from a porous material with mean pore diameters of less than 500 μm.

In USP 5,423,468 a sleeve of a porous material with pores of a size of approximately 25 μm is arranged on a load-bearing base body of a guide element. On the side around which the web is looped, the base body has bores for the passage of compressed air.

DE 31 31 621 A1 shows a turning bar with two longitudinally extending chambers of half-shell design, which selectively work together with the web as a function of the position of the turning bar in respect to the latter.

A turning bar with openings in a longitudinal section substantially arranged around the entire circumference for the emergence of compressed air, which can be brought into at least two angular positions in relation to an incoming web, is disclosed in DE 101 15 916 A1. The openings are assigned to two substantially half-shell-like halves of the cylindrical surface area of the guide element.

DE 31 27 872 A1 shows a pivotable turning bar, on whose one shiftable end blown air is supplied to the turning bar via a telescopic tube and an opening.

EP 0 705 785 A2 deals with the transport and directional change of a web-shaped material, in particular in the form of a film material. Air outlet openings, embodied as open micro-pores or micro-bores, are only provided in the

respective looped-around areas.

The object of the invention is based on producing guide

elements which are flexible in connection with the change of direction of a web and are simple to produce.

In accordance with the invention, this object is attained by means of the characteristics of claims 1 or 2.

The advantages to be gained by means of the invention consist in particular in that a guide element which can be flexibly inclined in respect to the web is created without a large structural outlay, which is distinguished by an air cushion of a large degree of homogeneity with simultaneously small losses.

By means of conventional openings, forces can be applied point-by-point to the material (impulse of the jet), by means of which the latter can be kept away from the respective component, or placed against another component, while, by means of the distribution of micro-openings with a high hole density, a broad support and, as a matter of priority, the effect of a formed air cushion, is applied. The cross section of bores used up to now lay for example in the range between 1 and 3 mm, while the cross section of the micro-openings is smaller by at least the power of ten. Because of this, substantially different effects arise. For example, the distance between the surface with the openings and the web can be reduced, the flow volume of flow means can drop considerably and by means of this, flow losses which possibly occur outside of the areas which act together with the web can be clearly reduced.

In contrast to known components with conventional

openings, or bores, a greatly more homogeneous surface is created with the formation of micro-openings on the surface with opening cross sections in the millimeter range and a hole distance of several millimeters. Here, micro-openings are understood to be openings in the surface of the component which have a diameter of less than or equal to 500 μm, advantageously less than or equal to 300 μm, in particular less than or equal to 150 μm. A "hole density" of the surface provided with micro-openings is at least one micro-opening per 5 mm^2 (=0.20/mm^2), advantageously at least one micro-opening per 3.6 mm^2 (= 0.28/mm^2).

Claims

1. A guide element of a web-producing or -processing machine with a plurality of openings (03) for the emergence of a fluid under pressure arranged on its surface area substantially around the entire circumference in at least one longitudinal section of the guide element, wherein the guide element (01) can be brought into at least two angular positions in relation to the incoming web (02), characterized in that the openings (03) are embodied as micro-openings (03) with a diameter of less than 500 μm, that the micro-openings (03) are embodied as open pores of a porous material (06), through which fluid flows and which is embodied as a layer (06) on a load-bearing support (07), which is at least in part fluid-permeable, and that in both angular positions the fluid in this longitudinal section exits from the micro-openings (03) substantially over the entire circumference.

2. A guide element of a web-producing or -processing machine with a plurality of openings (03) for the emergence of a fluid under pressure, wherein the guide element (01) can be brought into at least two angular positions in relation to the incoming web (02), characterized in that in every one of the two angular positions the fluid emerges from openings (03) provided on a side around which the web (02) is looped and which faces the web (02), as well as on an opposite away-facing side, that the micro-openings (03) are embodied as

outwardly oriented openings (03) of micro-bores (11) with a diameter of less than 500 μm in a wall (12) bordering the guide element (01) on the outside.

3. The guide element in accordance with claim 2, characterized in that the openings (03) in the surface area of the guide element (01) are arranged, at least in one longitudinal section of the guide element (01), substantially around the entire circumference.

4. The guide element in accordance with claim 2, characterized in that in both angular positions the fluid emerges from the openings (03) substantially over the entire circumference.

5. The guide element in accordance with claim 1, 2, 5 or 7, characterized in that the guide element (01) is pivotable around 90°, wherein in a first angular position a first, substantially half-shell-like half of the cylindrical surface area is clinched by the web (02), and in a second angular position a second half-shell-like half of the surface area is clinched.

6. The guide element in accordance with claim 1, characterized in that the pores of the fluid-permeable porous material have a mean diameter between 5 and 50 μm, in particular 10 to 30 μm.

7. The guide element in accordance with claim 1, characterized in that the porous material (06) is embodied as open-pored sinter material (06), in particular as a sinter metal.

8. The guide element in accordance with claim 1, characterized in that on its side facing the layer (06) the support (07) has at least one support surface connected with the layer (06), as well as a plurality of openings (09) for

feeding the fluid to the layer (06).

9. The guide element in accordance with claim 1, characterized in that in the area of the support surface the layer (06) has a thickness of less than 1 mm, in particular between 0.05 mm to 0.3 mm.

10. The guide element in accordance with claim 1,

characterized in that the support (07) has a plurality of passages (08), which are not particularly connected with each other, over its length and width acting together with the layer (06).

11. The guide element in accordance with claim 1, characterized in that the support (07) is embodied as a support tube (07) with a hollow profile, in particular a circular-ring-shaped profile.

12. The guide element in accordance with claim 11, characterized in that a wall thickness of the support tube (07) is greater than 3 mm, in particular greater than 5 mm.

13. The guide element in accordance with claim 1, characterized in that a degree of opening on the outwardly directed surface of the porous material (06) lies between 3% to 30%, in particular between 10% and 25%.

14. The guide element in accordance with claim 2, characterized in that a diameter of the openings (03) is less than or equal to 300 μm, in particular between 60 and 150 μm.

15. The guide element in accordance with claim 2, characterized in that a wall thickness of the wall (12) is between 0.2 to 3.0 mm.

16. The guide element in accordance with claim 2, characterized in that a hole density, i.e. a number of openings (03) per unit of area of the surface provided with micro-openings, is 0.20 / mm^2, at least 0.2 / mm^2.

17. The guide element in accordance with claim 1 or 2, characterized in that 1 to 20 standard cubic meters of air per hour emerge from a square meter of the surface area having the openings (03).

18. The guide element in accordance with claim 1 or 6, characterized in that 2 to 15, in particular 3 to 7, standard cubic meters of air per hour emerge from a surface area having the openings (03).

19. The guide element in accordance with claim 1, characterized in that the porous material (06) is charged from the inside with at least 1 bar of excess pressure.

20. The guide element in accordance with claim 1, characterized in that the porous material (06) is charged from the inside with fluid at an excess pressure of more than 4 bar, in particular 5 to 7 bar.

21. The guide element in accordance with claim 1 or 2, characterized in that a feed line for supplying the fluid to the guide element (01) has an inner cross section of less than 100 mm^2, in particular between 10 and 60 mm^2.

22. The guide element in accordance with claim 1 or 2, characterized in that the outer diameter of the guide element (01) is 60 to 100 mm.

23. The guide element in accordance with claim 1 or 2, characterized in that the guide element (01) has a length of more than 1,200 mm.

24. The guide element in accordance with claim 1 or 2, characterized in that the guide element (01) is embodied as a turning bar (01).

25. The guide element in accordance with claim 1 or 2, characterized in that the fluid under pressure is in the form of compressed air.